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### Application of Problem Based Learning (PBL) Learning Model in Improving Student Learning Outcomes in Natural Sciences Subjects of Material Changes in Objects in Class II MI Al-Islah Sidoarjo

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#### ABSTRACT

Background of this study is the low learning outcomes of science subjects class II MI Al-Islah Sidoarjo. The contributing factors are that learning is still conventional, learning is not student-centered, and students lack understanding of the concept, the teacher has not linked the material to real-life every day and is less innovative in the selection of learning models. This can be solved by applying the Problem Based Learning (PBL) learning model in natural science subject matter to change the shape of objects, so students are able to develop critical thinking and be able to solve problems. The purpose of this study are 1) To determine the application of the Problem Based Learning (PBL) learning model in improving student learning outcomes in Natural Sciences subject matter of material changes in class II MI Al-Islah Sidoarjo; 2) To find out the increase in student learning outcomes in natural science subject matter after changing the Problem Based Learning (PBL) learning model to class II MI Al-Islah Sidoarjo students. This research method is a classroom action research model of Kemmis and Taggart which consists of two cycles with four stages. This research was conducted at MI Al-Islah Sidoarjo in class II with 25 students consisting of 14 male students and 11 female students. Data collection techniques in the form of interviews, observation, documentation, and tests. The results showed that 1) The application of the Problem Based Learning (PBL) learning model of material changes can improve teacher activity and student activity. Teacher activity in the first cycle was 73% (enough category) in the second cycle increased to 91% (very good category). Student activity in the first cycle by 75% (enough category) in the second cycle increased to 94% (very good category). 2) Improved learning outcomes that score above KKM (80) with a percentage Pre-cycle 8%, first cycle 56% and second cycle 80%.

#### INTRODUCTION

The main need of humans is an education, so that every human being has a personality, intelligence and develops the ability to create a dignified national civilization. Republic of Indonesia National Education System Law No. 20 of 2003 Chapter I Article 1 (Paragraph 1) that education is a conscious and planned effort to create an atmosphere of learning and learning process

so that students actively develop their potential to have spiritual strength, self-control, personality, intelligence, noble character, and skills which is needed by himself, society, nation and state. Humans who have knowledge are obliged to practice / teach knowledge that has been obtained.

A teacher should have insight into the learning system so that expectations for achieving educational goals will be easy to

achieve. Formal educational institutions that play a role in educating the nation that is the school. Science is very important to be taught in elementary schools. One component of basic education is science learning.

Science learning is very important in education because science can train students to think objectively, develop process skills to investigate the surrounding environment, train students to understand the environment more deeply, develop knowledge and develop understanding concepts. Efforts to create students into the generation of adults who are literate in science, the teacher must equip students with skills so that students are able to process information in making decisions and improve the quality of everyday life. The involvement of students in conducting experiments and observations can develop the ability to think so as to improve students' knowledge and skills, automatically student learning outcomes will also increase.

The problem in education is how a learning process is designed and passed down in practice. In fact, many students do not like science because it is considered difficult, teachers use conventional learning models, limited ability and lack of motivation to learn. They hope that through learning science can build their knowledge through scientific work, be scientific, work together in groups and learn to communicate. Based on the results of researchers' interviews with the II grade MI Al-Islah Sidoarjo teacher, it was found that the low learning outcomes of science learning are seen from the KKM value determined by 80 only 11 students who finished out of 25 students and the obstacles that arise in the teaching and learning process that takes place the students chatting with peers, students do not understand the concept and passive students when learning takes place. Following up on this phenomenon, researchers sought to improve the solution of the learning process by innovating innovations in the learning model used during learning. Therefore, answering the problem, the researcher took the title "Application of the Model of Problem Based Learning (PBL) in Improving Student Learning Outcomes in Natural Science Subjects of

Material Change in Objects in Class II MI Al-Islah Sidoarjo".

The research objectives are (1) Determine the application of the Problem Based Learning (PBL) learning model in improving student learning outcomes in Natural Sciences subject matter of material changes in class II MI Al-Islah Sidoarjo. (2) Find out the increase in student learning outcomes in natural science subject matter changes in objects after applying the Problem Based Learning (PBL) learning model to class II MI Al-Islah Sidoarjo students. Problem Based Learning is one of the learning models that involves students to solve a problem through the stages of the scientific method so that students can learn knowledge related to the problem and at the same time have the skills to solve problems (Ngalimun, 2012: 89). The characteristics of the learning model in Arends' opinion are: asking questions / problems, focusing on interdisciplinary linkages, authentic inquiry, and collaboration, producing products and exhibiting them (Trianto, 2009: 93).

Briefly, the steps forward in Problem Based Learning expressed by Richard L. Arends are a) student orientation to the problem, b) organizing students to research, c) helping independent and group investigations / investigations, d) developing and presenting their work, and e) analyze and evaluate the process of overcoming problems (Ngalimun, 2012: 96). Student learning outcomes are abilities acquired by children after learning activities. Because learning itself is a process of someone trying to obtain some form of behavior change that is relatively sedentary (Ahmad Susanto, 2013: 5). The main key to obtaining measurements and data on student learning outcomes is to know the outline of indicators associated with the types of achievement that are to be achieved, assessed, or even measured. The learning outcomes examined in this study are the science learning outcomes of science which include three levels namely remembering (C1), understanding (C2), and analysis (C4). Each learning model has weaknesses and strengths including the PBL model; The strengths of the PBL model are

that it suits students' real life, concepts according to students' needs, fosters students' inquiry nature, improves problem solving skills. The drawback is the difficulty of finding relevant problems for students, conceptual mist often occurs, a lot of time consumption.

## METHODS

The research method used is Classroom Action Research or classroom action research. Classroom action research is a plan for learning activities in the form of an action, which is deliberately raised and occurs in a class simultaneously (Classroom action research is a plan for learning activities in the form of an action, which is deliberately raised and occurs in a class simultaneously (Suharsimi Arikunto, 2007: 3) This study uses the Kemmis and Taggart models, each cycle consisting of four components of action namely planning, acting, observing and reflecting in an interrelated spiral (Kurniasih, 2014: 29). This study has the subject of research and a research place in MI Al-Islah Sidoarjo with 25 students. This study has 3 variables, the input variable is Grade II MI Al-Islah Sidoarjo students; the process variable is the application of the Problem Based Learning (PBL) learning model; the output variable enhances student learning outcomes Natural Sciences subject matter change with the object means. Data collection techniques in this study used 4 techniques including interviews to determine the initial conditions of Class II MI Al-Islah Sidoarjo students, observations used to determine the activities of teachers and students in the learning process, documentation to get data on the number of students, notes, school archives, learning planning, data about value data, student attendance lists, books, documents, etc. needed during the learning process and the fourth test used to determine student learning outcomes. Researchers share with teachers in carrying out this research. Researchers are tasked with practicing the Guided Note Taking strategy in learning science subjects. While the teacher is tasked with observing the activities of the teacher and students in the learning process takes place.

## RESULTS AND DISCUSSION

In this study, researchers conducted 2 stages, namely cycle I and cycle II. Researchers do two stages because there are things that have not been achieved in cycle I. The following data are obtained from the results of the study:

### Cycle I

In the first cycle, the researcher made the lesson plans first and compiled data collection instruments in the form of observations of teacher and student activities along with the test instruments. Validating the two devices to the expert lecturer is the next step to find out about how valid the equipment will be deployed in the field. After that the researchers applied the two devices to students. In learning Problem Based Learning (PBL) lies in the core activities. The results of the application of the learning model Problem Based Learning (PBL) in the first cycle of material changes in the form of objects in the activities of teachers by 73% (enough categories) and in student activities by 75% (enough categories). The average grade obtained in the first cycle was 67.04 while the percentage of students graduating reached 56%. In the implementation of the first cycle which has been known to be less than the maximum student learning outcomes, it is necessary to repeat it by continuing to the second cycle.

### Cycle II

In the second cycle did not differ greatly in planning. Just like cycle I, in cycle II researchers made new devices. The difference between RPP Cycle I and RPP Cycle II lies in the core activities. The different learning steps in the second cycle include the introduction of the teacher delivering the learning objectives by writing on the blackboard and the core activities of the teacher providing information and guiding by demonstration in front of the class that will be followed by students to solve the problems given by the teacher so students get new experiences. The results of the application of the learning model Problem Based Learning (PBL) in the second cycle material changes in the form of objects in the activities of teachers by 91% (very good category) and in student activities by 94% (very good category). The average grade obtained

in the second cycle is 87.92 while the percentage of graduation students reaches 80%. Both of these results have reached the performance indicators set by the researcher, so the researcher does not proceed back to the next cycle.

In the application of the learning model Problem Based Learning (PBL) material changing the shape of objects can increase teacher activity and student activity. Teacher activity in the first cycle was 73% (enough category) in the second cycle increased to 91% (very good category). The following diagram is about the percentage of teacher and student activities:

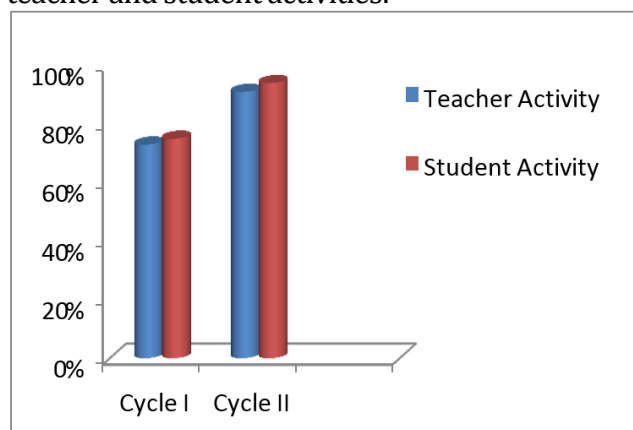


Figure 1: Presentation Diagram of Teacher and Student Activities in Cycle I and Cycle II

The implementation of the learning process carried out by the teacher as a whole the activity is quite good category and almost all learning steps have been carried out in accordance with the Learning Implementation Plan (RPP), but there are still some learning activities that have not been implemented well by the teacher, among others, the introduction of the teacher does not clearly explain the learning objectives to be achieved by students, so seeing the shortage the teacher writes the written learning objectives so that students know and save things what things will be learned. Referring to Kemp and David E. Kapel's writings, the learning objectives of a specific statement expressed in behavior or appearance are manifested in written form to describe the expected learning outcomes. In cycle I students' discussion activities were not conducive because they did not understand the explanation from the teacher so the teacher explained again from group one to the other group. The teacher corrects these deficiencies by providing guidance and providing information so

students learn more actively. The teacher provides information and guides by means of demonstrations in front of the class that will be followed by students to solve problems that have been given by the teacher so that students get new experiences. When students conduct an investigation to gather information, develop and present the results of their work can improve student learning outcomes because the mastery of knowledge and skills is more effective if students can experience it themselves. This is in line with Trianto that involves students in their own investigations, thus enabling them to interpret and explain real world phenomena and build understanding of these phenomena independently (Trianto, 2007: 61). When students understand, student learning outcomes will increase as well. This is in accordance with the opinion (Nur Wakhidah, 2017: 217) that the experience can provide real practice in analyzing problems in the surrounding environment, by experiencing a person's retention of understanding will increase. Improved learning outcomes that scored above the KKM (80) with a percentage of 8% prasiklus, cycle I 56% and cycle II 80%.

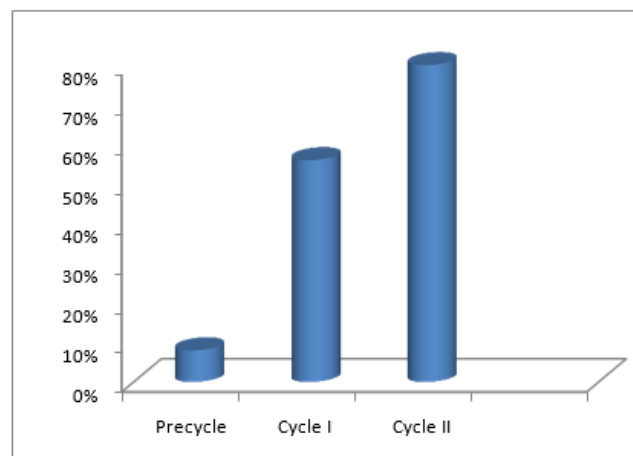


Figure 2 Presentation Diagram of Student's Graduation in Precycle, Cycle I and Cycle II

Researchers carry out the Pre Test by providing individual tests in the form 10 items of written test in multiple choice form and 5 items of written test in Essay form to determine students' initial abilities. Based on the Pre Test results of 25 students, the number of students who completed the pre-cycle was 8%. In cycle I the number of students who finished as many as 14 students while 11 students did not complete. The

percentage of students' mastery learning is 56%. In cycle II the percentage of students' mastery learning reached 80% with a total of 20 students completing and 5 students included in the unfinished category.

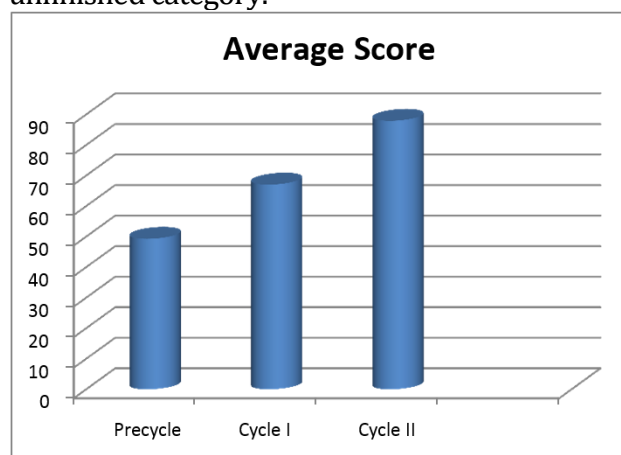


Figure 3. Diagram of The Average Grade Values in Precycle, Cycle I and Cycle II

Based on these pictures shows an increase in the average value of learning outcomes from pre-cycle to cycle II. Improving the results of the evaluation of student learning outcomes from pre-cycle get an average value of 49.28 (less) while in the first cycle is the average value of learning outcomes 67.04 (enough) and the average value at the second cycle stage is 87.92 (very good).

Based on these data it can be said that there was a significant increase in learning outcomes from cycle I to cycle II in the material change in the form of objects of natural science subjects (IPA) by applying the Problem Based Learning (PBL) learning model. The value achieved by students has reached the criteria and percentage of mastery learning that has been set on the indicators of success. The conclusion from the results of these data is the application of the Problem Based Learning (PBL) learning model on material changes in the subject matter of Natural Sciences (IPA) can improve learning outcomes in class II MI Al-Islah Sidoarjo students. Based on the explanation above, this research is said to be successful and shows that the learning model Problem Based Learning (PBL) can improve learning outcomes so that students can achieve completeness criteria, especially on material changes in the subject matter of Natural Sciences (IPA) class II MI Al-Islah Sidoarjo.

## CONCLUSION

Based on classroom action research by conducting two cycles through the application of the Problem Based Learning (PBL) learning model on the material change in objects in class II MI Al-Islah Sidoarjo can be concluded that:

1. The application of the Problem Based Learning (PBL) learning model in improving student learning outcomes in natural science subject matter material changes in class II MI Al-Islah Sidoarjo has improved in the learning process and is an appropriate model for tackling these problems. This is evident from the results of the observation percentage of teacher activity in the first cycle reached 73% (enough) an increase of 18% so that in the second cycle increased to 91% (very good). Increasing the percentage of observations of student activity in the first cycle reached 75% (good) increased to 94% (very good) in the second cycle. Based on the explanation, it can be concluded that the activities of teachers and students during the learning process have increased significantly.
2. Student learning outcomes have increased after applying the Problem Based Learning (PBL) learning model of natural science subject matter material changes in class II MI Al-Islah Sidoarjo. This is evident from the percentage of students' mastery learning in the pre-cycle getting an average of 49.28 (less) with a percentage of completeness of 8% (very less), in cycle I got an average grade of one class reaching 67.04 (enough) with a percentage of completeness 56% (enough). Meanwhile, in the second cycle the average value of one class reached 87.92 (very good) with 80% completeness (good). Based on the data in cycle II it can be said that the average value and percentage of student's completeness increases. The average value of students increased by 20.88 and the percentage of mastery learning increased by 24%.

## Suggestion

1. Guiding individual or group investigations on the Problem Based Learning (PBL) learning model is needed. The teacher must facilitate maximally and provide information so students learn more actively, students are not

confused and students do not hesitate to work on assignments given by the teacher.

2. Researchers hope that teachers can apply the Problem Based Learning (PBL) learning model in Natural Sciences subjects with other materials.

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